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Arctic sea-level reconstruction analysis using recent satellite altimetry

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We present a sea-level reconstruction for the Arctic Ocean using recent satellite altimetry data. The model, forced by historical tide gauge data, is based on empirical orthogonal functions (EOFs) from a calibration period; for this purpose, newly retracked satellite altimetry from ERS-1 and -2 and Envisat has been used. Despite the limited coverage of these datasets, we have made a reconstruction up to 82 degrees north for the period 1950–2010.

We place particular emphasis on determining appropriate preprocessing for the tide gauge data, and on validation of the model, including the ability to reconstruct known data. The relationship between the reconstruction and climatic variables, such as atmospheric pressure, and climate oscillations, including the Arctic Oscillation (AO), is examined.